



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Wellinghoff § Group Art Unit: 1756  
Serial No.: 10/057,548 § Examiner: Sadula  
Filed: 01/23/2002 § Atty. Docket No.: SWRI-2835-08  
Title: Methods for Synthesis of Liquid Crystals

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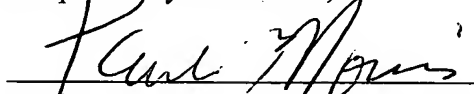
Dear Sir:

In compliance with the duty of disclosure under 37 C.F.R. § 1.56, it is respectfully requested that this Supplemental Information Disclosure Statement be entered and the references listed on the attached Forms PTO/SB/08A and PTO/SB/08B be considered by the Examiner and made of record.

This Supplemental Information Disclosure Statement is not to be considered as a representation that a search has been made or that no other material information as defined under 37 C.F.R. § 1.56 exists.

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Respectfully submitted,

  
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**Complete if Known**

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Examiner Name	Sadula
Attorney Docket Number	SwRI-2835-08

Sheet 1 of 5

**U. S. PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)			
		US- 5,808,108	09-15-98	Chappelow, et al.	
		US- 5,624,976	04-29-1997	Klee	
		US- 4,914,221	04-03-1990	Winkler, et al.	
		US- 2004/0199004	10-07-2004	Wellinghoff, et al.	
		US- 2002/0036285 A1	03-28-2002	Prechtl, et al.	
		US- 6,699,405 B2	03-02-2004	Prechtl, et al.	
		US- 6,204,302	03-20-2001	Rawls, et al.	
		US- 5,563,230	10-08-1996	Hsu	
		US- 2004/0144954 A1	07-29-2004	Wellinghoff	
		US- 6,090,308	07-18-2000	Coates	
		US- 5,073,294	12-17-1991	Shannon	
		US- 5,202,053	04-13-1993	Shannon	
		US- 4,201,856	05-06-1980	Jackson Jr.	
		US- 2003/0055280 A1	03-20-2003	Wellinghoff	
		US- 5,654,471	08-05-1997	Zahn	
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**FOREIGN PATENT DOCUMENTS**

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Sheet	2	of	5	Attorney Docket Number	SwRI-2835-08

NON PATENT LITERATURE DOCUMENTS			
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		CHOI, Rheological studies on sterically stabilized model dispersions of uniform colloidal spheres. II. Steady-shear viscosity, J. Colloid Interface Science., September 1986, pp. 101-113, Vol. 113(1), Academic Press, Inc.	
		CONDON, Reduction of composite contraction stress through non-bonded microfiller particles, Dental Materials, July 1998, pp. 256-260, Vol. 14.	
		HELLWIG, Influence of an incremental application technique on the polymerization of two light-activated dental composite filling materials, Dtsch. Zahnaerztl Z., 1991, pp. 270-273, Vol. 46.	
		HIKMET, Anisotropic polymerization shrinkage behavior of liquid-crystalline diacrylates, Polymer, 1992, pp. 89-95, Vol. 33(1), Butterworth-Heinemann Ltd.	
		NORLING ET AL, Polymerizable nematic liquid crystal monomers for reduced shrinkage restorative resins, Proc. 17th Southern Biomed. Eng. Conf., 1998, p. 120.	
		LIU, Constant-volume polymerization of composites by addition of ammonia-modified montmorillonite, American Journal of Dentistry, April 1990, pp. 44-50, Vol. 3(2).	
		MILLICH, Elements of light-cured epoxy based dental polymer systems, J. Dent. Res., April 1998, pp. 603-608, Vol. 77(4).	
		RAWLS ET AL, Low Shrinkage resins from liquid crystal diacrylate monomers, ACS Polymer Preprints, September 1997, pp. 167-168, Vol. 38(2).	
		STANSBURY ET AL, Cyclopolymerizable Monomers for use in dental resin composites, J. Dent. Res., March 1990, pp. 844-848, Vol. 69(3).	
		UNO ET AL, Marginal adaptation of a restorative resin polymerized at reduced rate, Scand. J. Dent. Res., 1991, pp. 440-444, Vol. 99(5).	

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Sheet

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		HOLMBERG, Ester Synthesis with Dicyclohexycarbodiimide Improved by Acid Catalysts, Acta Chemica Scandinavica, 1979, pp. 410-412, Vol. B 33.	
		NAKAMURA, Characterization of Epitaxially Grown ZnS : Mn Films on a GaAs(100) Substrate prepared by the Hot-wall Epitaxy Technique, J. Mater. Chem., 1991, pp. 357-359, Vol. 1(3).	
		SCHULTZ, Polymerization and Viscoelastic Behavior of Networks from a Dual-Curing, Liquid Crystalline Monomer, J. Polym. Phys., 1999, pp. 1183-1190, Vol. 37, John Wiley & Sons, Inc.	
		GRIFFIN, Mesogenic Polymers. III. Thermal Properties and Synthesis of Three Homologous Series of Thermotropic Liquid Crystalline "Backbone" Polyesters, Journal of Polymer Science: Polymer Physics Edition, 1981, pp. 951-969, Vol. 19, John Wiley & Sons, Inc.	
		HUTCHINS, Aqueous Polar Aprotic Solvents. Efficient Sources of Nucleophilic Oxygen, J. Org. Chem. 1983, pp. 1360-1362, Vol. 48, The American Chemical Society.	
		KORNBLUM, Displacement of the Nitro Group of Substituted Nitrobenzenes - a Synthetically Useful Process, J. Org. Chem., 1976, pp. 1560-1564, Vol. 41, The American Chemical Society.	
		CLARK, X-Ray Scattering Study of Smectic Ordering in a Silica Aerogel, Physical Review Letters, November 22, 1993, pp. 3505-3508, Vol. 71, No. 21, The American Chemical Society.	
		BROER, In-Situ photopolymerization of oriented liquid-crystalline acrylates, 4 Influence of a lateral methyl substituent on monomer and oriented polymer network properties of a mesogenic diacrylate, Makromol. Chem. 1989, pp. 3201-3215, Vol. 190, Huthig & Wepf Verlag Basel, Heidelberg, New York.	
		BARCLAY, Liquid Crystalline and Rigid-rod Networks, Prog. Polym. Sci., 1993, pp. 899-945, Vol. 18(5), Pergamon Press Ltd.	
		Liquid Crystalline Polymers to Mining Applications, Encyclopedia of Polymer Science and Engineering, 1987, pp. 1-61, Vol. 9, John Wiley & Sons, New York.	

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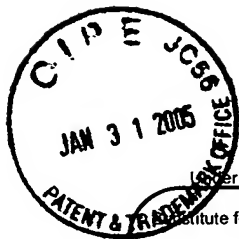
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		MEEK, Inertness of Tetrachlorofulvenes in the Diels-Alder Reaction, J. Org. Chem., January 9, 1958, pp. 1708-1710, Vol. 22 (12), The American Chemical Society.	
		SUZUKI ET AL, Preparation of poly(dimethylsiloxane) macromonomers by the initiator method: 2. Polymerization mechanism, Polymer, 1989, pp. 333-337, Vol. 30(2), Butterworth	
		KOCHAN ET AL, Solid Freeform Manufacturing - Assessments and Improvements at the Entire Process Chain, Proceedings of the Seventh International Conference on Rapid Prototyping, March 31-April 3, 1997, pp. 203-214, 94RA021.	
		NORLING ET AL, Cure shrinkage of experimental LC monomer based composite resins, Abstract, American Association for Dental Research meeting, 2001, Chicago, IL.	
		MOGRI ET AL, Thermomechanical of liquid crystalline monomer in dental composites, Abstract, American Association for Dental Research meeting, 2001, Chicago, IL.	
		DOWELL ET AL, The Effect of Silanation on Polymerization and Dynamic Mechanical Behavior of a homogenous nanofilled resin, Abstract, American Association for Dental Research meeting, 2001, Chicago, IL.	
		LOGAN ET AL, Effect of Silanation on Mechanical Properties of Homogeneous Nanofilled resins, Abstract, American Association for Dental Research meeting, 2001, Chicago, IL.	
		NORLING ET AL, Synthesis of a new low shrinkage liquid crystal monomer, Abstract, American Association for Dental Research meeting, 2000, Washington, D.C.	
		FURMAN ET AL, A Radiopaque Zirconia Microfiller for Translucent Composite Restoratives, Abstract, American Association for Dental Research meeting, 2000, Washington, D.C.	
		GENG, Targeted Drug Release by a Novel Polymeric Device Based on EVA (Ethylene Vinyl Acetate) For Periodontal Condition, (ABSTRACT).	

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		BOLAND ET AL, Cell Survival and Cytokine Expression by Dental Cells Treated with a Liquid Crystal Resin Monomer, J. Dent. Res., 2001, pp. 151 (Abstract 928), Vol. 80.	
		WANG, Rheological Properties of Dental Composites, (ABSTRACT).	
		WELLINGHOFF ET AL, Reduced Shrinkage dimethacrylate liquid crystal resins, J. Den. Res. 1997, pp. 279 (Abstract 2127), Vol. 76.	
		NORLING ET AL, Cure shrinkage of composite resins and an experimental LC monomer, J. Dent. Res., 1999, pp. 233 (Abstract 1020), Vol. 78.	
		PANYAYONG, Effects of Corn-Starched & Primer Additions on Mechanical Properties of Provisional Dental Resin, (ABSTRACT).	

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